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THE

ONTARIO WATER RESOURCES  
COMMISSION

WATER POLLUTION SURVEY

of the

VILLAGE OF RICHMOND

COUNTY OF CARLETON

VILLAGE OF RICHMOND - 1968  
COUNTY OF CARLETON

1968

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TD  
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1968

Report on a water pollution  
survey of the village of  
Richmond, county of Carleton.

80329

REPORT

on a

WATER POLLUTION SURVEY

of the

VILLAGE OF RICHMOND

COUNTY OF CARLETON

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DISTRICT ENGINEERS BRANCH

DIVISION OF SANITARY ENGINEERING

WATER POLLUTION SURVEY  
OF THE  
VILLAGE OF RICHMOND

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# ONTARIO WATER RESOURCES COMMISSION

## REPORT

### INTRODUCTION

A water pollution survey was made of the Village of Richmond by Commission staff on August 27, 1967. This type of survey is intended to locate potential and existing sources of pollution which could adversely affect the water quality. If the results of the survey indicate a pollution problem, corrective action is recommended to those parties concerned.

Samples were collected from various outfalls and watercourses which contained significant flow. The samples were submitted to the OWRC laboratory in Toronto for examination and analysis.

The appendices to this report include the laboratory results, a map showing the location of the sampling points as well as an interpretation of the analysis. A section has also been included on local planning and methods used to finance the development of water and sewage works.

Valuable assistance was obtained from Mr. C. F. Mann, Clerk, Village of Richmond and Messrs. J. M. Pelton and G. J. W. Reynolds, Public Health Inspectors with the Carleton County Health Unit, during this survey.

## VILLAGE OF RICHMOND

### General

The Village of Richmond is located in the Township of Goulbourn approximately 15 miles south-west of the City of Ottawa. Richmond became an incorporated village in 1850. According to the 1967 Municipal Directory the population of the village is 1309. Many of the residents find employment in the City of Ottawa. A recent report on the village suggests that by 1986 the population can be expected to reach the 2,400 mark. The present site the village occupies is contained in an area of 1590 acres.

### Geology

The Village of Richmond is built on a clay plain which averages between 20' to 30' deep. The bedrock underlying this area is limestone, formed in the Pleistocene Era and recent geological times.

### Surface Drainage

The Village of Richmond Lies in the drainage basin of the Jock River which is a tributary of the Rideau River. The Jock River flows in a north-north easterly direction through the centre of the village. Because of the relatively regular topography in this region the Jock River has the characteristics of a mature stream. Three

small creeks also provide drainage in the village. The largest of these is known as Marlborough Creek, which flows through the eastern section of the village parallel to the Jock River and joins the Jock River approximately one mile north of the village. The other two creeks drain the western section of the village and flow in an easterly direction to the Jock River.

#### Water Supply

There is no municipal or communal water supply system in the village. Water is obtained from individual dug and drilled wells. The water is generally hard but appears to be plentiful and of good quality. The static water levels in the wells located in the village vary from free flowing to a depth of 18 feet. The water is obtained from the limestone bedrock at depths between 40 and 90 feet.

#### Waste Disposal

Sewage disposal is practiced on an individual basis, utilizing sub-surface systems. The Carleton County Health Unit supervises the installation of all new septic tank systems. Some waste disposal problems have occurred with a number of private systems as a result of the soil conditions and the limited lot sizes.



At the present time the Village of Richmond is engaged in the development of a sewage works under the provincial financing scheme. The proposed sewage works programme is to include the collection system, pumping stations and a ten-acre lagoon. The need for a municipal sewage works is reflected in the laboratory results of the samples obtained from a number of storm sewer outfalls. It appears that a number of citizens utilize the storm sewer systems for the disposal of sanitary wastes. The local officials are actively taking steps to control the illegal sanitary waste discharges.

In 1961 a Modified Activated Sludge Treatment Plant was placed in operation at the south Carleton High School. The present capacity is 0.03 MGD. This system will be abandoned when the municipal sewage system is developed.

The Village of Richmond lacks industrial development and as a result the community is not burdened with the disposal of industrial wastes.

The Village of Richmond has a garbage collection service which employs a disposal site located approximately three miles west of the village. The nearest drainage course is approximately one-half mile west of this site and therefore this operation is not considered as a serious

threat to surface water quality.

#### SAMPLING PROCEDURE

Bacteriological and sanitary chemical samples were collected from the water courses at pertinent points in the village. Samples were also collected from outfalls where significant flow was noted.

The samples were submitted to the Ontario Water Resources Commission Laboratory in Toronto for examination and analysis. An explanation is made in the appendix as to the significance of the analysis.

The weather conditions at the time were overcast, with mild weather. Unusually heavy precipitation has occurred in the Ottawa Valley this past summer and consequently the flow in the river at the time of sampling was greater than normal for this time of year.

#### SUMMARY & CONCLUSION

A water pollution survey performed in the Village of Richmond on August 27, 1967, confirmed the need for the development of a municipal sewage works by virtue of the evidence of sanitary wastes in the storm sewers as well as the general quality of the watercourses.

The municipal officials of the Village of Richmond have shown themselves to be forward thinking and progressive in their decision to proceed with the development of a sewage works. They are to be commended for their positive action.

cb

Prepared By:

  
J. A. Clarke,  
Technologist,  
Division of Sanitary Engineering.

## APPENDIX

### IMPLEMENTATION OF WATER AND SEWAGE WORKS PROGRAMS

Currently, there are three general methods which may be utilized for implementing sewage and water works programs. These are: 1) to enter into an agreement with the OWRC for the construction of the treatment and collector works with an obligation to pay the debt retirement and operating charges over the term of the agreement with the facility reverting to the municipality at the end of the term of the agreement, 2) by requesting the provision of service from a Provincially-owned project, and 3) by proceeding with the construction independently and meeting capital costs by the sale of debentures.

### OWRC/MUNICIPAL PROJECTS

For the construction of water and sewage works under agreement with this Commission, the works are provided and developed under Sections 39 to 46 of the Ontario Water Resources Commission Act.

For this type of arrangement, the Commission utilizes a sinking fund and consequently the annual payments are based on a specific debt retirement period and the payments are unchanged for the period of the agreement. This type of project may be financed over a period of time up to a maximum of thirty years. The annual charges for projects constructed under this agreement are determined as follows:

#### 1. Capital Repayment

As noted, OWRC financing is by the sinking fund method and an annual payment of approximately 2 per cent of the capital

cost is required to retire a debt over a thirty-year period.

2. Interest

On new Commission projects, interest is calculated at the current rate.

3. Reserve Fund

To provide money for repairs and replacements, Section 40 of The Ontario Water Resources Commission Act provides for the establishment of a reserve fund by the Commission. It is important to note that this fund is established in the name of the municipality and the balance consequently earns interest. It has now been established by Commission minute that the reserve fund billing for each project shall continue only until the fund reaches an amount of ten times the initial annual billing and the reserve fund billing shall be re-imposed only when the fund has been depleted to 80 per cent or less of the maximum amount.

4. Operating Costs

Under OWRC agreement, the municipality is responsible only for the operating costs directly attributed to the project in the municipality. Therefore, no charges are made by the Commission for the services of head office personnel who are available as required to advise on the satisfactory operation and maintenance of the project.

PROVINCIALY-OWNED WORKS

In June, 1967, the Honourable J. R. Simonett, Minister of Energy and Resources Management, made an announcement which expanded the authorization of this Commission for the provision of water supply and sewage treatment facilities. This new program allows the Commission to construct entire water and sewage works facilities for small municipalities. The capital costs of these can be amortized over a 40 year period.

A slight variation of this program could be implemented in that the municipality may request that this Commission provide only the major water and sewage works facilities as Provincially-owned works, and develop the water distribution and sewage collector systems under the standard type of Commission project. It would appear that where applicable, it would be more advantageous for the municipality to proceed on the basis of requesting this Commission to develop entire systems as Provincially-owned works.

The associated cost of supplying these works, including amortization of capital costs, together with operating and maintenance charges, will be recovered by the sale of service to the affected municipalities by rates determined on a usage basis. These facilities will be wholly-owned by the Province of Ontario and the arrangements for service will be formalized by contracts between the Commission and the municipality concerned. The installations will be operated entirely at cost with appropriate provision for adjustment in rate.

DEVELOPMENT

If a municipality, after considering the alternatives, wishes this Commission to consider Provincially-financed projects, application forms should be completed and submitted together with a resolution of the Municipal council. A draft of the suggested wording of the resolution is included with the application forms.

If the proposed works are to be built by the municipality on its own initiative or as a formal project under agreement with this Commission, it is required that the Council retain a consulting engineer to prepare preliminary engineering reports on the proposed work. If a Provincial system is contemplated, no action should be taken with respect to retaining a consulting engineering firm as the Commission will designate a consulting engineer to carry out the Provincial portion of the work and it would be advantageous if the municipal portion be studied and reported on by the same engineer.

## APPENDIX II

### COMMUNITY PLANNING

The need for effective planning has become more important today than ever before. Municipalities are being burdened with the rising costs of land and labour. Therefore any project a community hopes to develop should be based on sound planning. Planning at all levels of government is essential but, community planning can be most effective if interest and initiative is generated at the local level. The enormous benefits accrued as a result of good planning can more than compensate for the initial investment.

Community planning can be described as an effort to control and direct development effectively. This can best be achieved through the development of an official plan. An official plan is the stated intention of the local authorities with respect to orderly development within the planning area, that is prepared and set forth with professional assistance and meets the requirements as set out by the Provincial Planning Act. An official plan can be a joint effort by a number of municipalities which have common basic characteristics and common problems, or one municipality can establish a plan on its own initiative.



Orderly development yields future economy in services. Development in the community can be retarded where an official plan does not exist. A plan provides, among other things, the framework for the rational design of water and sewage works and also the extensions of mains and collector sewer systems.

A local council having decided to proceed with a programme of community planning definitely should contact the Ontario Department of Municipal Affairs. Through its many branches, information and guidance is provided to all interested parties.

JAC

## APPENDIX III

### SIGNIFICANCE OF LABORATORY ANALYSES

#### Bacteriological Examination

The presence of coliforms indicates pollution from human or animal excrement, or from some non-faecal forms. The objective for surface water quality in Ontario is a maximum of 2400 organisms per 100 millilitres.

The OWRC Laboratories employ the Membrane Filter (MF) technique of examination to obtain a direct enumeration of coliform organisms. The Department of Health Laboratories use the Most Probable Number (MPN) enumeration and coliform counts are reported as Total Coliform Organisms (TC) and Faecal Coliform Organisms (FC).

#### Sanitary Chemical Analyses

##### Biochemical Oxygen Demand (BOD)

Biochemical Oxygen Demand is reported in parts per million (ppm) and is an indication of the amount of oxygen required for the stabilization of decomposable organic or chemical matter in water. The completion of the laboratory test required five days, under the controlled incubation temperature of 20° Centigrade.

The OWRC objective for surface water quality is an upper limit of four (4) ppm.

### Solids

The value for solids, expressed in parts per million, is the sum of the values for the suspended and the dissolved matter in the water. The concentration of suspended solids is generally the most significant of the solids analyses with regard to surface water quality. The effects of suspended solids in water are reflected in difficulties associated with water purification, deposition in streams and injury to the habitat of fish.

### Anionic Detergents as ABS

The presence of anionic detergents as ABS is an indication that domestic waste is present.

### Phenols

The presence of phenol or phenolic equivalents is generally associated with discharges containing petroleum products, or with wastes from some industries. It is generally conceded that adequate protection of surface waters will be provided if the concentration of phenols in waste discharges does not exceed 20 parts per billion (ppb). Phenolic type waste can cause objectionable conditions in water supplies and might taint the flesh of fish.

VILLAGE OF RICHMOND  
WATER POLLUTION SURVEY

| <u>SAMPLING<br/>POINT NO.</u> | <u>LOCATION (DESCRIPTION)</u>                                        | <u>DATE</u> | <u>5-DAY BOD</u> | <u>S O L I D S</u> |              |             | <u>TOTAL COLIFORM<br/>1 per 100 ML</u> |
|-------------------------------|----------------------------------------------------------------------|-------------|------------------|--------------------|--------------|-------------|----------------------------------------|
|                               |                                                                      |             |                  | <u>TOTAL</u>       | <u>SUSP.</u> | <u>DISS</u> |                                        |
| RJ 26.3                       | Jock River at E. Limit of Village                                    | Aug. 27/67  | 1.5              | 300                | 5            | 295         | 660                                    |
| RJ 26.7                       | Jock River intersection of Cockburn St. & Strachan Street            | Aug. 27/67  | 2.1              | 240                | 7            | 233         | 6,000                                  |
| RJ 26.9                       | Jock River at McBean Street Bridge                                   | Aug. 27/67  | 2.2              | 286                | 6            | 280         | 1,540                                  |
| RJ 26.9<br>N-W                | Storm sewer outfall on north side of Jock River at McBean St. Bridge | Aug. 27/67  | 4.2              | 820                | 4            | 816         | 30,000                                 |
| RJ 26.9<br>S-W                | Storm sewer outfall on south side of Jock River at McBean St. Bridge | Aug. 27/67  | 7.9              | 570                | 5            | 565         | 440,000                                |
| RJ 27.2                       | Jock River near intersection of Fowler St. & Burk Street             | Aug. 27/67  | 1.8              | 224                | 6            | 218         | 97,000                                 |
| RJ 27.4                       | Jock River E. side at Ottawa Street                                  | Aug. 27/67  | 1.7              | 386                | 6            | 380         | 570                                    |

< Cont'd next page >

VILLAGE OF RICHMOND

| <u>SAMPLING<br/>POINT NO.</u> | <u>LOCATION (DESCRIPTION)</u>                 | <u>DATE</u> | <u>5-DAY BOD</u> | <u>S O L I D S</u> |              |             | <u>TOTAL COLIFORM<br/>1 per 100 ML</u> |
|-------------------------------|-----------------------------------------------|-------------|------------------|--------------------|--------------|-------------|----------------------------------------|
|                               |                                               |             |                  | <u>TOTAL</u>       | <u>SUSP.</u> | <u>DISS</u> |                                        |
| RJY 0.15                      | Y Creek At King Street                        | Aug. 27/67  | 2.8              | 286                | 34           | 252         | 8,000                                  |
| RJY 0.31 W                    | At Murray St. Storm<br>sewer effluent         | Aug. 27/67  | ---              | ---                | --           | ---         | <4                                     |
| RJY 0.37                      | Y Creek west of<br>Murray Street              | Aug. 27/67  | 1.4              | 370                | 13           | 357         | 129,000                                |
| RJY 0.37 W                    | Storm sewer outfall<br>at Hamilton Street     | Aug. 27/67  | ---              | ---                | --           | ---         | 530,000                                |
| RJX 0.00                      | X Creek effluent to<br>Jock River             | Aug. 27/67  | ---              | ---                | --           | ---         | 10,000                                 |
| RJX 0.14                      | X Creek at Fowler<br>Street North             | Aug. 27/67  | 1.4              | 370                | 13           | 357         | 1,370                                  |
| M-0.6                         | Marlborough Creek at<br>Marlborough R. Bridge | Aug. 27/67  | 1.9              | 306                | 4            | 302         | 390                                    |
| M-1.1                         | Marlborough Creek at<br>Ottawa Street East    | Aug. 27/67  | 1.7              | 386                | 6            | 380         | 570                                    |